

# Effects of storage conditions and humic substances on the germination capacity of wheat and spinach seeds

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Fast and uniform seed germination and emergence are important factors determining a successful start of the growing season. Gaining insight into the activity of plant derived compounds that benefit seed germination, in both optimal and under stress conditions, is of fundamental importance to improve crop performance. Experiments were set up to study the effect of storage conditions and exogenous applications of Humifirst®, a liquid concentrate based on humic acids (12 %) and fulvic acids (3 %), on the seed germination properties of different wheat and spinach genotypes. The results revealed that the storage conditions were the main factor affecting seed germination. Optimal storage conditions (-18 °C) resulted in a significantly faster germination, more uniform and a higher germination percentage compared to suboptimal storage conditions (20 °C). Although the effect was not always significant, humic substances resulted in a faster and higher germination percentage for wheat seeds stored under optimal conditions. In addition, spinach seeds stored under optimal conditions and treated with humic substances resulted in a slightly higher total germination. In case seeds were stored under suboptimal conditions, the humic substances were not able to improve the germination capacity.